

AlphaServer 8400 Upgrade Manual

Order Number EK-T8430-UI. A01

Use this manual as a quick reference to upgrade a DEC 7000/10000 or VAX 7000/10000 system to an AlphaServer 8400 system. Refer to the *DEC 7000 AXP System/VAX 7000 Platform Service Manual* (EK-7000A-SV) and the *AlphaServer 8200/8400 Service Manual* (EK-T8030-SV) for more information.

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FCC NOTICE: The equipment described in this manual generates, uses, and may emit radio frequency energy. The equipment has been type tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such radio frequency interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference, in which case the user at his own expense may be required to take measures to correct the interference.

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Preface

Intended Audience

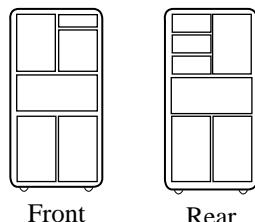
This manual is written for the customer service engineer.

Document Structure

This manual uses a structured documentation design. Topics are organized into small sections for efficient online and printed reference. Each topic begins with an abstract. You can quickly gain a comprehensive overview by reading only the abstracts. Next is an illustration or example, which also provides quick reference. Last in the structure are descriptive text and syntax definitions.

Conventions Used in This Document

Icons. Icons similar to those shown below are used in illustrations for designating part placement in the system described. A shaded area in the icon shows the location of the component or part being discussed.



Front

Rear

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Documentation Titles

Table 1 lists the books in the AlphaServer 8200 and 8400 documentation set. Table 2 lists other documents that you may find useful.

Table 1 AlphaServer 8200 and 8400 Documentation

Title	Order Number
Hardware User Information and Installation	
<i>Operations Manual</i>	EK-T8030-OP
<i>Site Preparation Guide</i>	EK-T8030-SP
<i>AlphaServer 8200 Installation Guide</i>	EK-T8230-IN
<i>AlphaServer 8400 Installation Guide</i>	EK-T8430-IN
Service Information Kit	QZ-00RAC-GC
<i>Service Manual</i> (hard copy)	EK-T8030-SV
<i>Service Manual</i> (diskette)	AK-QKNFA-CA
Reference Manuals	
<i>System Technical Manual</i>	EK-T8030-TM
<i>DWLPA PCI Adapter Technical Manual</i>	EK-DWLPA-TM
Upgrade Manuals for Both Systems	
<i>KN7CC CPU Module Installation Card</i>	EK-KN7CC-IN
<i>MS7CC Memory Installation Card</i>	EK-MS7CC-IN
<i>KFTHA System I/O Module Installation Guide</i>	EK-KFTHA-IN
<i>KFTIA Integrated I/O Module Installation Guide</i>	EK-KFTIA-IN
Upgrade Manuals: 8400 System Only	
<i>AlphaServer 8400 Upgrade Manual</i>	EK-T8430-UI
<i>BA654 DSSI Disk PIU Installation Guide</i>	EK-BA654-IN
<i>BA655 SCSI Disk and Tape PIU Installation Guide</i>	EK-BA655-IN
<i>DWLAA Futurebus+ PIU Installation Guide</i>	EK-DWLAA-IN
<i>DWLMA XMI PIU Installation Guide</i>	EK-DWLMA-IN
<i>DWLPA PCI PIU Installation Guide</i>	EK-DWL84-IN
<i>H7237 Battery PIU Installation Guide</i>	EK-H7237-IN

Table 1 AlphaServer 8200 and 8400 Documentation (Continued)

Title	Order Number
<i>H7263 Power Regulator Installation Card</i>	EK-H7263-IN
<i>H9F00 Power Upgrade Manual</i>	EK-H8463-UI
<i>KFMSB Adapter Installation Guide</i>	EK-KFMSB-IN
<i>KZMSA Adapter Installation Guide</i>	EK-KXMSX-IN
<i>RRDCD Installation Guide</i>	EK-RRDRX-IN
Upgrade Manuals: 8200 System Only	
<i>DWLPA PCI Shelf Installation Guide</i>	EK-DWL82-IN
<i>H7266 Power Regulator Installation Card</i>	ED-H7266-IN
<i>H7267 Battery Backup Installation Card</i>	EK-H7267-IN

Table 2 Related Documents

Title	Order Number
General Site Preparation	
<i>Site Environmental Preparation Guide</i>	EK-CSEPG-MA
System I/O Options	
<i>BA350 Modular Storage Shelf Subsystem Configuration Guide</i>	EK-BA350-CG
<i>BA350 Modular Storage Shelf Subsystem User's Guide</i>	EK-BA350-UG
<i>BA350-LA Modular Storage Shelf User's Guide</i>	EK-350LA-UG
<i>CIXCD Interface User Guide</i>	EK-CIXCD-UG
<i>DEC FDDIcontroller 400 Installation/Problem Solving</i>	EK-DEMFA-IP
<i>DEC FDDIcontroller/Futurebus+ Installation Guide</i>	EK-DEFAA-IN
<i>DEC FDDIcontroller/PCI User Information</i>	EK-DEFPA-IN

Table 2 Related Documents (Continued)

Title	Order Number
<i>DEC LANcontroller 400 Installation Guide</i>	EK-DEMNA-IN
<i>DSSI VAXcluster Installation/Troubleshooting Manual</i>	EK-410AA-MG
<i>EtherWORKS Turbo PCI User Information</i>	ED-DE435-OM
<i>KZPSA PCI to SCSI User's Guide</i>	EK-KZPSA-UG
<i>RF Series Integrated Storage Element User Guide</i>	EK-RF72D-UG
<i>StorageWorks RAID Array 200 Subsystem Family Installation and Configuration Guide</i>	EK-SWRA2-IG
<i>StorageWorks RAID Array 200 Subsystem Family Software User's Guide for OpenVMS AXP</i>	AA-Q6WVA-TE
<i>StorageWorks RAID Array 200 Subsystem Family Software User's Guide for DEC OSF/I</i>	AA-Q6TGA-TE
Operating System Manuals	
<i>Alpha Architecture Reference Manual</i>	EY-L520E-DP
<i>DEC OSF/I Guide to System Administration</i>	AA-PJU7A-TE
<i>Guide to Installing DEC OSF/I</i>	AA-PS2DE-TE
<i>OpenVMS Alpha Version 6.2 Upgrade and Installation Manual</i>	AA-PV6XC-TE

Procedure

Overview

The upgrade procedure has 11 steps:

1. Check all materials.
2. Prepare the site.
3. Power down the system.
4. Remove the modules from the LSB card cage.
5. Remove the LSB card cage from the cabinet.
6. Install the TLSB card cage.
7. Install the clock card in the TLSB card cage.
8. Transfer the 2-Gbyte SIMMs to the TLSB 2-Gbyte motherboard.
9. Insert memory, I/O, and terminator modules in the TLSB card cage.
10. Insert processor modules in the TLSB card cage.
11. Update device firmware and verify the system.

CAUTION: Because of the weight of the LSB and TLSB card cages, this procedure requires two people.

Before You Begin

You might need to install other equipment not included in this upgrade procedure.

For CD-ROM drive installation, see *RRDCD Installation Guide*, EK-RRDRX-IN.

For KFE70-AA and PCI installation, see *DLWPA PCI PIU Installation Guide*, EK-DWL84-IN.

If you are upgrading a VAX 7000/10000, please note the following AlphaServer 8400 requirements:

- CD-ROM — The system must have a CD-ROM in the cabinet.
- DSSI — The KFMSB adapter must be used. (KFMSA is not supported.)
- VAXBI — VAXBI is not supported.
- XMI — The minimum revision of the DWLMA module (T2028) is F02.

Check All Materials

Check that the upgrade kit is complete. You will need other materials as well.

Table 3 Upgrade Hardware

Quantity	Part Number	Description
1	E2056-CA or -DA	KN7CC-AA or -AB processor module
1	E2052-AA	KFTHA four-hose I/O module
6	E2034-AA	LTM terminator modules
1	54-21728-01	System clock card
1	70-30430-01	TLSB enclosure assembly
1	74-46897-01	Terminal cover
1	74-46740-01	Enclosure mounting bracket front top
1	74-46958-01	Enclosure mounting bracket front bottom
1	74-46885-01	Enclosure mounting bracket rear bottom
9	90-40122-01	M5 flathead screws for brackets
2	90-40148-02	M5 kepnuts for terminal cover
1	74-50090-01	AlphaServer 8400 product ID label
1	36-26123-07	Return to Digital shipping label
9	90-09984-22	Pan head screws
1	36-45176-01	Product change label

NOTE: The upgrade kit can be ordered with an empty 2-Gbyte motherboard (MS7CC-UC) for upgrading from an MS7AA-FA module.

The upgrade kit includes one processor module, one KFTHA I/O module, six terminator modules, and either an empty 2-Gbyte memory motherboard (SIMMs from an existing 2-Gbyte memory are transferred to it) or no memory. Additional modules are ordered separately. See the *Digital Systems and Options Catalog* for more information.

Other upgrade materials include:

Tools

- Small and large flathead screwdrivers
- Small and large Phillips head screwdrivers
- 8 mm and 10 mm nutdrivers
- Adjustable wrench
- Torque wrench

Antistatic bags

One for each LSB module

Documentation

- AlphaServer 8400 Upgrade Manual* (EK-T8430-UI)
- AlphaServer 8200/8400 Operations Manual* (EK-T8030-OP)
- AlphaServer 8200/8400 Site Preparation Guide* (EK-T8030-SP)
- AlphaServer 8400 Installation Guide* (EK-T8430-IN)

Operating system

- OpenVMS Version 6.2 or later
- Digital UNIX Version 3.2B or later

NOTE: When unpacking the upgrade kit, inspect the honeycomb EMI screen on the top and bottom of the TLSB card cage for damage.

Prepare the Site

Update the operating system software, get a hard copy of the system configuration, and calculate power requirements.

Example 1 DEC 7000/10000 Self-Test Display

F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0	NODE #
							A	M	.	.	.	.	.	.	P	TYP
							O	+	.	.	.	.	.	.	+	ST1
							B	BPD
							O	+	.	.	.	.	.	.	+	ST2
							B	BPD
							+	+	+	ST3
							B	BPD
+	.	.	.	+	.	.		+	+	.	C0 XMI +
.	C1
.	C2
.	C3
								.	A0	.	.	.	.	.	.	ILV
								.	2GB	.	.	.	.	.	.	2GB

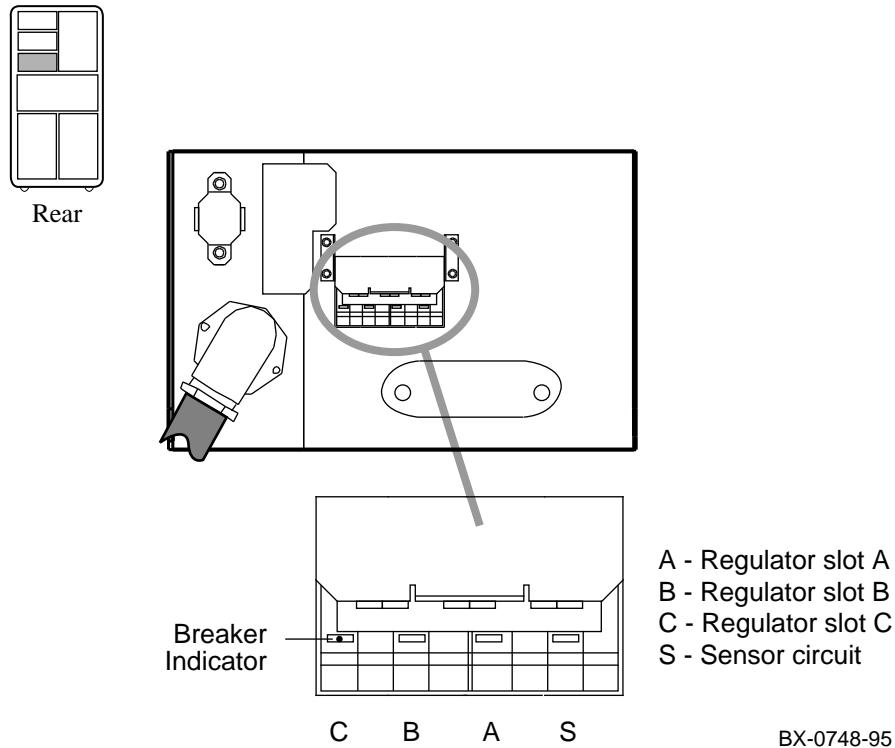
Firmware Rev=V4.0-1234 SROM Rev=V3.0-1 SYS SN=GA12345678 **3**

1. Check that the operating system is at the minimum revision for an AlphaServer 8400 system (see page 3). If necessary, update the operating system software now.
2. Shut down the operating system and issue the console commands **show configuration**, **show device**, and **show *** to show the system configuration and environment variables. Keep a hard copy of the output for reference at the end of this upgrade procedure.
3. While in console mode, initialize the system (issue the **init** command). Note the serial number that appears at the bottom of the self-test display. See ③ in Example 1.
4. If the power requirements of the upgraded system have not already been calculated, do so now to determine the number of power regulators required in each cabinet. See the AlphaServer 8400 Power Configuration Table in the *Digital Systems and Options Catalog*.

Power Down the System

Turn off power to the system and remove the main cabinet front door.

Figure 1 System Circuit Breaker

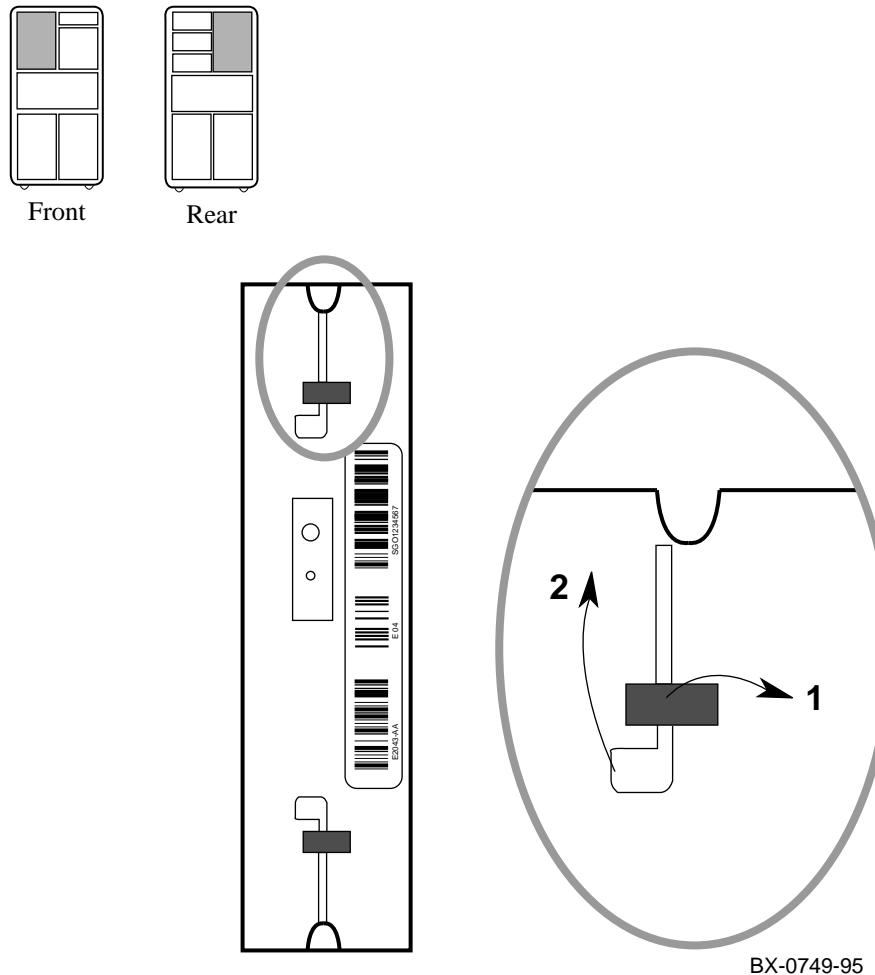


1. With the system in console mode, turn the keyswitch on the control panel to Disable.
2. Open the rear door of the cabinet and push the handle down on the circuit breaker (see Figure 1). The breaker indicators change to green.
3. To ensure that the circuit breaker is not unintentionally switched on, flip the lockout plate down and lock the tag in place with a padlock.
4. Remove the front door of the cabinet.

Remove the Modules from the LSB Card Cage

Put on an antistatic wrist strap, release the door covers on the LSB card cage, remove all LSB modules and place them in antistatic bags, and replace the door covers. You will need a small and a large flathead screwdriver.

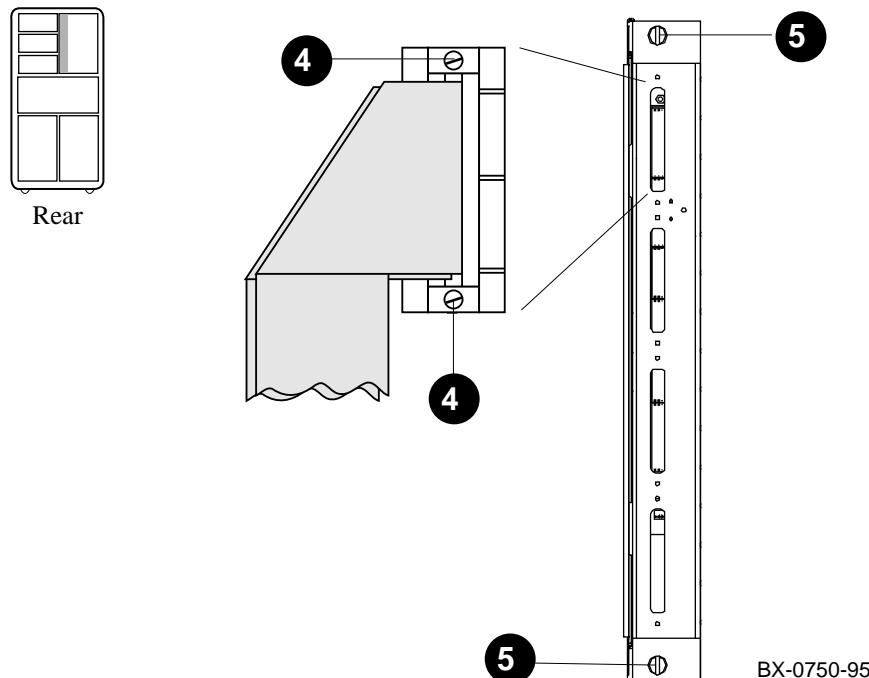
Figure 2 Removing Modules from the LSB Card Cage



Tools required: small and large flathead screwdrivers

1. Ground yourself to the cabinet with the antistatic wrist strap.
2. Release the door covers on the front and rear of the LSB card cage by loosening the half-turn Phillips screws on the ends of the covers.
3. Remove each processor and memory module by pulling the black restraining clips out and to the right, pulling out both levers, and then pulling out the module (see Figure 2). Place each module in an antistatic bag as it is removed from the card cage. Remove any filler modules.
4. At the rear of the cabinet, use the small flathead screwdriver to disconnect all I/O cables from the IOP module (E2044-AA). See **4** in Figure 3.
5. Use the large flathead screwdriver to remove the large screws at the top and bottom of the IOP module. See **5** in Figure 3. Remove the IOP module and place it in an antistatic bag.
6. Replace the door covers on the LSB card cage.

Figure 3 Removing I/O Cables

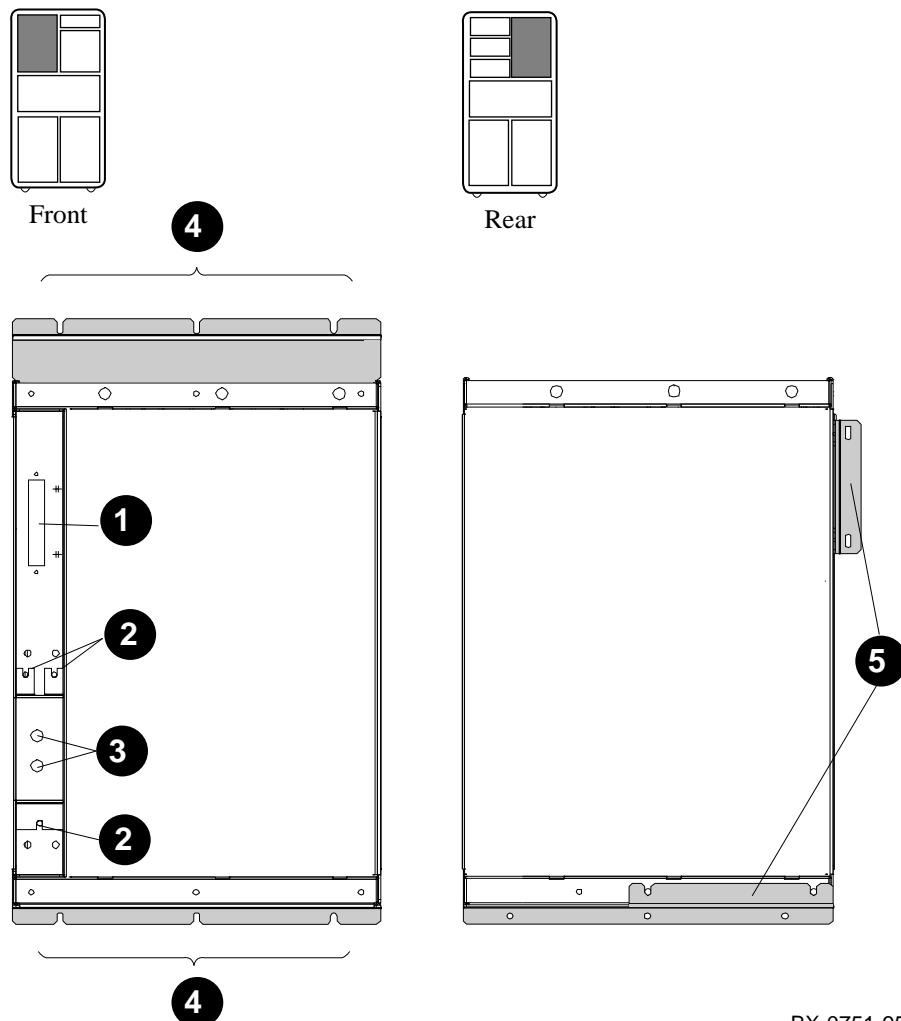


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Remove the LSB Card Cage from the Cabinet

Disconnect the power connectors and the CCL cable from the power filter, detach the card cage from the frame and slide it out the front of the cabinet. You will need a Phillips head screwdriver and 8 mm and 10 mm nutdrivers.

Figure 4 Removing the LSB Card Cage



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Tools required: Phillips head screwdriver, 8 mm and 10 mm nutdrivers

NOTE: You will need to save some hardware for the TLSB card cage installation.

1. At the front of the LSB card cage, disconnect the CCL cable (see **1** in Figure 4).
2. Use the 8 mm nutdriver to remove the nuts from the terminal cover (see **2**).
3. Use the 10 mm nutdriver to remove the power and ground cables from the power and ground posts (see **3**). Save the washers and nuts.
4. At the front of the card cage, use the Phillips head screwdriver to remove the top three and bottom three screws that attach the card cage to the frame (see **4**). Save the screws.
5. At the rear of the card cage, use the Phillips head screwdriver to remove the two brackets (right side and bottom) from both the card cage and the frame (see **5**). Save the right side bracket and screws.

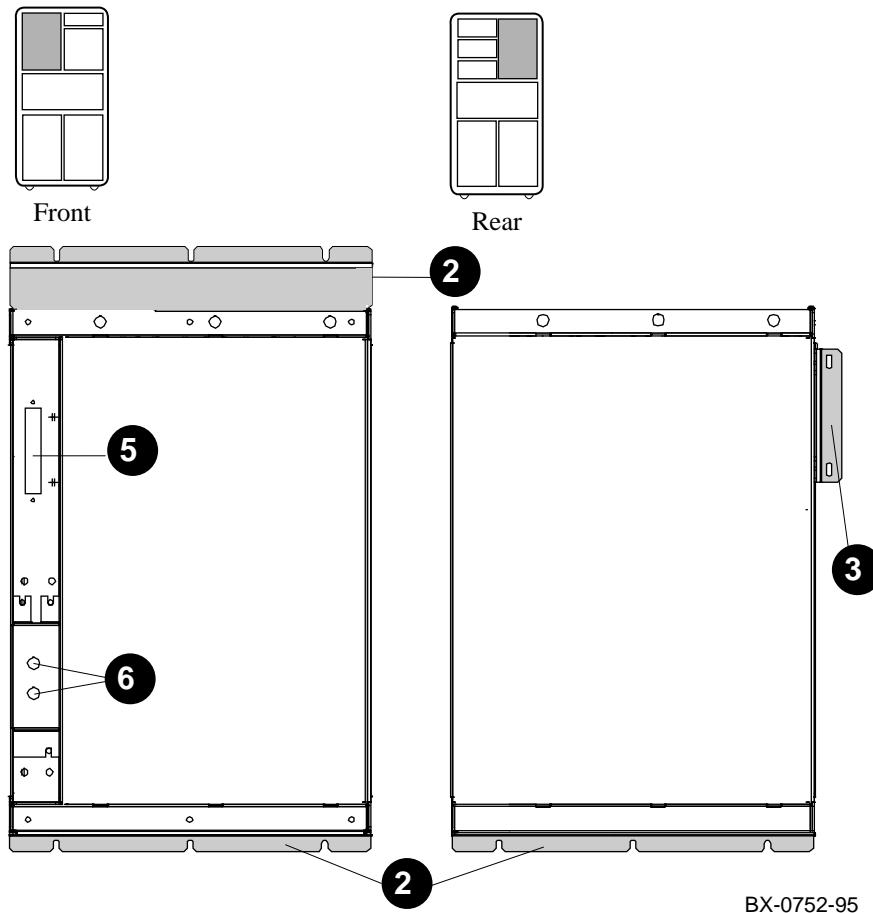
CAUTION: The following step requires two people.

6. Move the power and CCL cables out of the way and slide the card cage out the front of the cabinet. The weight of the card cage and the height at which it is installed make removing it alone dangerous.

Install the TLSB Card Cage

Slide the TLSB card cage into the cabinet from the front, attach the brackets to the cage and the cabinet frame, and connect the power cables and the CCL cable. You will need a Phillips head screwdriver and 8 mm and 10 mm nutdrivers.

Figure 5 Installing the TLSB Card Cage



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Tools required: Phillips head screwdriver, 8 mm and 10 mm nutdrivers

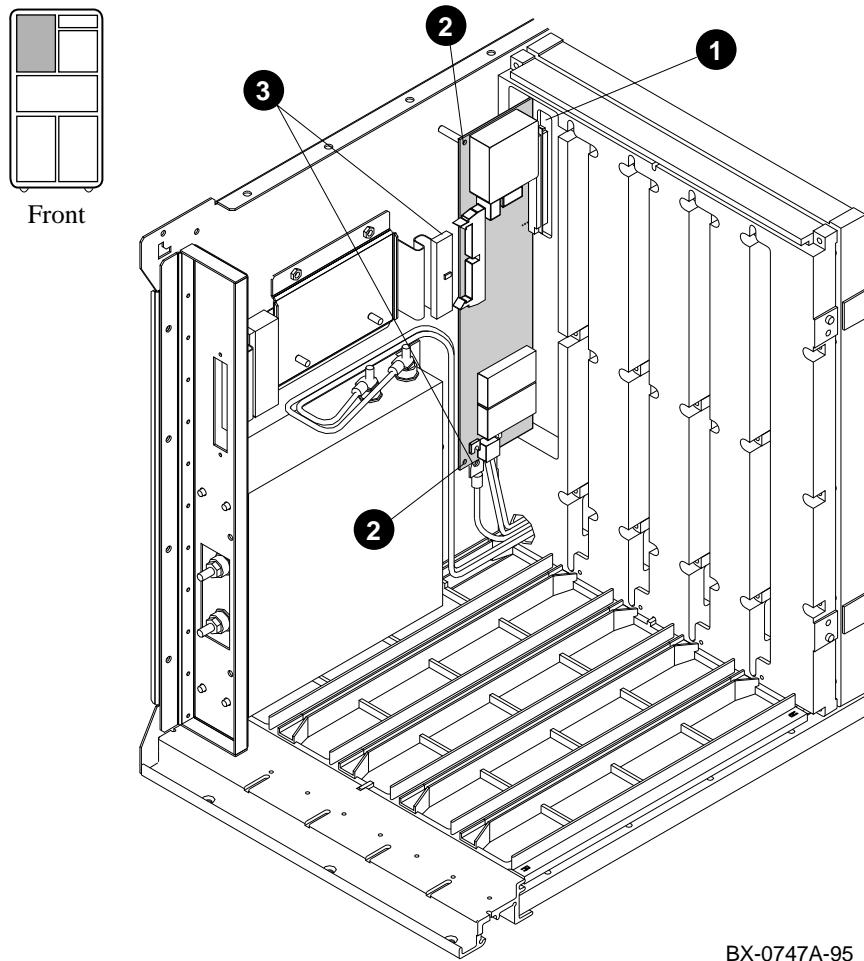
CAUTION: The first step requires two people.

1. From the front, slide the TSLB card cage into the cabinet so that the label is at the top on the front and the power filter is to the left.
2. Using the flathead screws from the upgrade kit, attach the front top and bottom brackets and the rear bottom bracket to the card cage. See **②** in Figure 5.
NOTE: The rear bottom bracket is deeper than the front one. If these two brackets are swapped, the holes in the side rear bracket will not line up correctly in the next step. (See Table 3 on page 2 for part numbers.)
3. At the rear of the cabinet, use the Phillips head screwdriver to loosely install the reserved side bracket to the frame with two reserved screws (see **③**). Line up the other two holes in the bracket with the card cage holes and insert two reserved screws. Tighten all four screws. Attach the card cage to the frame at the bottom with three reserved screws.
4. At the front of the cabinet, use the Phillips head screwdriver to attach the card cage to the frame at the top and bottom with five reserved screws.
5. Attach the CCL cable (see **⑤**).
6. Use the 10 mm nutdriver and the reserved nuts and washers to attach the power and ground cables to the power posts (see **⑥**). (Place a washer behind the power cable connector and one in front of the connector, then attach and tighten the nut.) The yellow cable (+48 V) attaches to the top post; the gray cable (ground) attaches to the bottom post.
7. Use the 8 mm nutdriver and the kepnuts from the upgrade kit to install the terminal cover (also from the upgrade kit) over the power posts.

Install the Clock Card in the TSLB Card Cage

The clock card is located behind the power filter. It is attached with two Phillips screws, and power and CCL cables are connected to it. You will need a Phillips screwdriver.

Figure 6 Installing the System Clock Card



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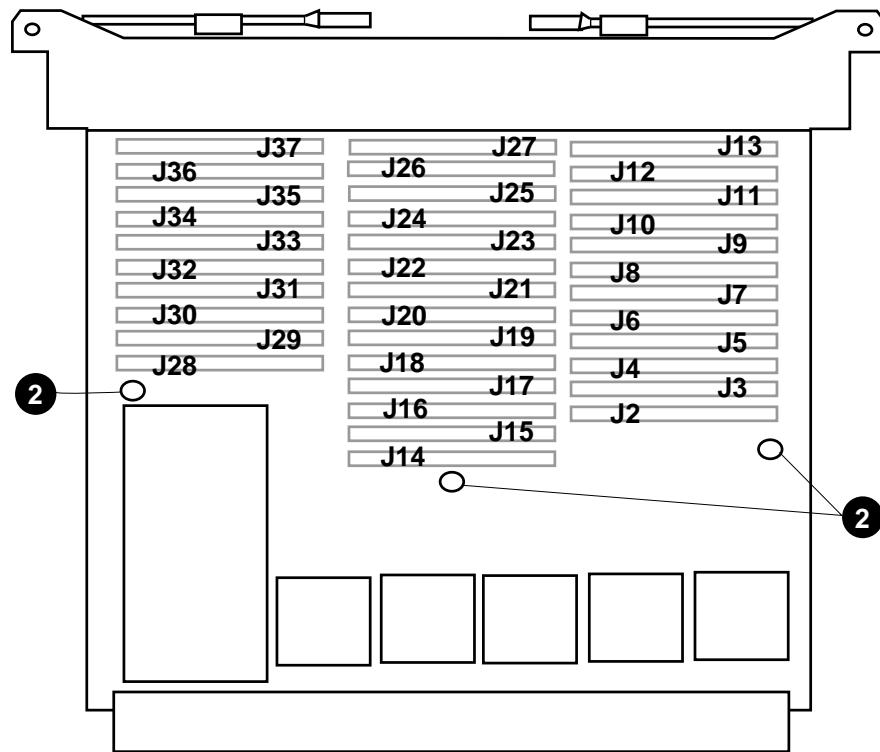
Tools required: Phillips screwdriver

1. Insert the clock card in the centerplane connector. See **1** in Figure 6.
2. Fasten the clock card in place with two Phillips screws. See **2**.
3. Connect the power and CCL cables. (The connectors are keyed.) See **3**.

Transfer the 2-Gbyte SIMMs to the TSLB 2-Gbyte Motherboard

If the system had a 2-Gbyte memory module, the SIMMs can be used in the upgraded system. They must, however, be transferred to a new 2-Gbyte motherboard that is compatible with the TSLB bus. You will need a small Phillips screwdriver, an adjustable wrench, and a torque wrench.

Figure 7 E2036 Memory Module



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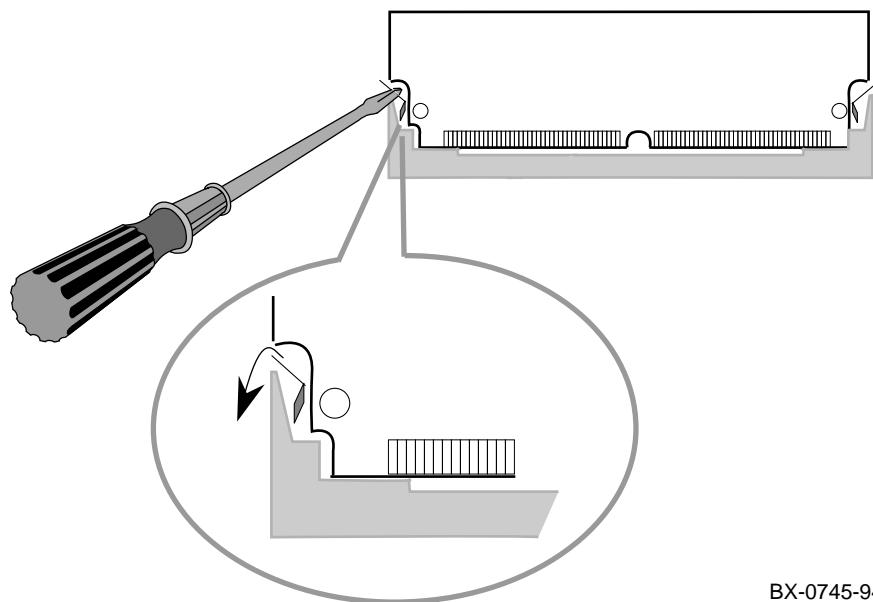
Tools required: small Phillips screwdriver, adjustable wrench, torque wrench

1. Place the two memory modules on ESD pads on a level surface. Remove both covers from the TSLB module, E2036. (Each cover is attached to the module by

nine screws. The screws that attach to the endplate are larger than those that attach to the standoffs.)

2. Use the adjustable wrench to remove the standoffs from the E2036 module. See **②** in Figure 7.
3. Remove the SIMMs from the LSB module. Beginning with the SIMMs closest to the gate arrays, release the latches on both ends of the SIMM connector by carefully inserting a small Phillips screwdriver into the slot and pressing down. See Figure 8.
4. Insert the SIMMs in the TLSB module, starting with J13, J27, or J37 (see Figure 7). Place the SIMM into the connector at a 45 degree angle. As you rotate it to an upright position, the latches will snap into place. (The SIMM is keyed on the sides and in the center so that the correct side faces front.)
5. Replace the standoffs on the TLSB module. The square standoff goes on side 1 (the component side) and the hexagonal standoff on side 2. Torque the standoffs to 12 inch-pounds (15 inch-pounds maximum).
6. Replace the covers on the TLSB module.
7. Place the LSB module in an antistatic bag.

Figure 8 Removing SIMMs from the 2-Gbyte Motherboard

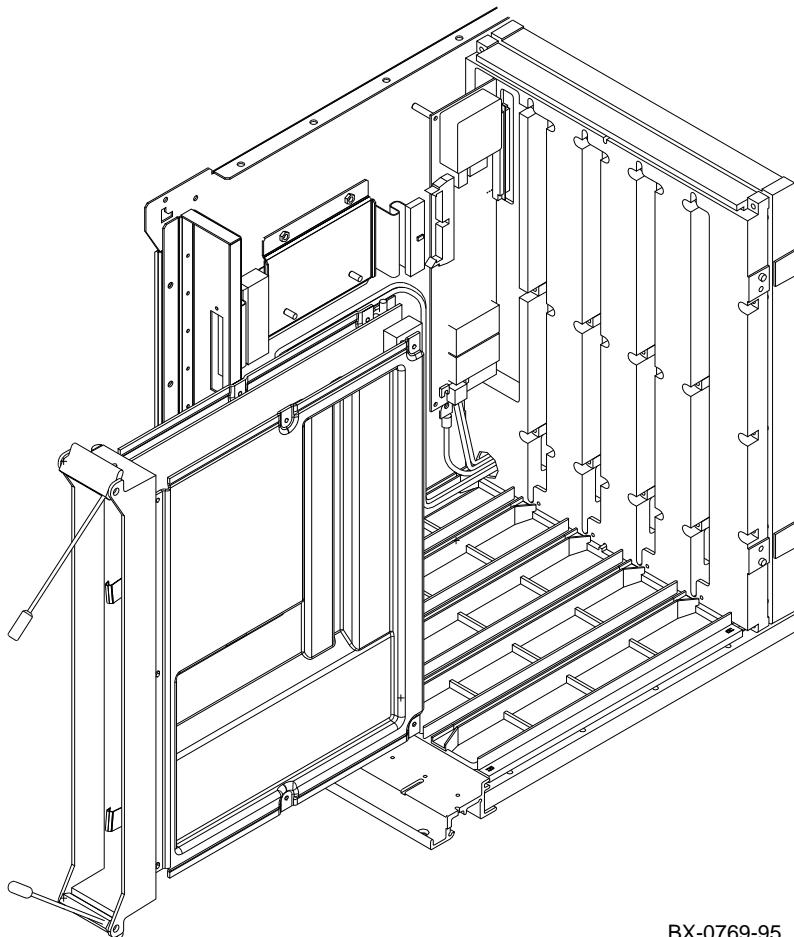


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Insert Memory, I/O, and Terminator Modules in the TSLB Card Cage

Determine the placement of the modules, put on the antistatic wrist strap, and insert modules from left to right, being careful not to damage the EMI gaskets. You will need a small flathead screwdriver.

Figure 9 Inserting Modules in the TSLB Card Cage



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Tools required: small flathead screwdriver

1. Before installing the modules, determine their placement:
 - a. KN7CC processor modules start at slot 0 and work up to slot 5.
 - b. The KFTHA I/O module is in slot 8.
 - c. The first MS7CC memory module is in the highest-numbered open slot, the next in the lowest-numbered open slot, and so on, alternating between highest- and lowest-numbered open slots.
 - d. Terminator modules (E2034-AA) go in all other slots.
2. Ground yourself to the cabinet with the antistatic wrist strap.
3. Insert the memory, I/O, and terminator modules in the TLSB card cage. (You will insert the processor modules in the procedure on the next page.)

CAUTION: To avoid damaging an EMI gasket, insert modules from left to right. These gaskets can easily break, and a broken piece of gasket can damage a module or the centerplane.

- a. Remove the module from its packaging and release the spring-loaded handles from the stops. To do this, push both handles toward the module endplate and away from the stops.
- b. Hold the module assembly by the endplate. Align the module with the card guide and the cover with the rail (see Figure 9).
- c. Slide the module into the card cage as far as it will easily go.
- d. When the module stops, check that the projections on the top and bottom of the endplate are aligned with the slots in the card cage. If they are not, remove the module and realign it.
- e. Push both handles at the same time to the module endplate. You will feel the module make contact with the connectors at the centerplane. Release the handles so they spring back into the stops.

4. Using the small flathead screwdriver, attach the I/O cables to the I/O port module, starting with the bottom cable.

Insert Processor Modules in the TSLB Card Cage

Insert processor modules one at a time and update console firmware if necessary. After all have the same version of the firmware, insert all processor modules.

Example 2 Inserting Processor Modules

F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0	NODE #
						A	M	.	.	.	.	.	.	.	P	TYP
						o	+	.	.	.	.	.	.	.	++	ST1
						EB	BPD
						o	+	.	.	.	.	.	.	.	++	ST2
						EB	BPD
						+	+	++	ST3
						EB	BPD
						+	C0 XMI +	
						C1	
						C2	
						C3	
							A0	.	.	.	.	.	.	.	ILV	
							2GB	.	.	.	.	.	.	.	2GB	
AlphaServer 8400 Console V1.0, ④ SROM V1.0, Apr 1 1995 16:17:26																
P00>>> boot dkd400 -f1 0,a0 ⑤																
[LFU boots]																
UPD> update kn7cc*																
Confirm update on:																
kn7cc-ab0																
[Y/(N)]y																
WARNING: updates may take several minutes to complete for each device.																
DO NOT ABORT!																
kn7cc-ab0 Updating to 3.2-32... Verifying 3.2-32... PASSED.																
UPD> exit																
Initializing...																
[self-test display appears]																
P00>>> build -e kn7cc-ab0																
Build EEPROM on kn7cc-ab0 ? [Y/N]> y																
EEPROM built on kn7cc-ab0																
P00>>>																

If the system has more than one processor module, the modules shipped might have different versions of console firmware. Results are unpredictable if you install all processor modules at the same time and power up the system, so install each module individually and update the console firmware on each if necessary.

If the system has just one processor module, do only the first five steps of the following procedure.

1. Insert a processor module in slot 0.
2. Unlock the lockout plate on the system circuit breaker and push the handle up. The breaker indicators change to red.
3. Power up the system. The console self-test runs.
4. Check the version of console firmware in the processor module. See **④** in Example 2.
5. If the firmware is not the latest version, update it using LFU (see **⑤**). Then exit LFU and build the EEPROM.
6. Power down the system and remove the processor module.
7. Repeat steps 1 and 3 through 6 for each processor module in the system.
8. After the console firmware has been updated on all processor modules, install all of them, following guidelines on page 19.

Update Device Firmware and Verify the System

Replace the front door, attach the AlphaServer 8400 logo and the product change label, turn on the system, and run console diagnostics. Check the system configuration against the old configuration. Boot the operating system and run VET.

Example 3 Updating Firmware and Verifying the System

```
P00>>> set sys_model_num 8400      ⑤
P00>>> set sys_serial_num <number>
P00>>> set <envar>
P00>>> boot dkd400 -f1 0,a0      ⑥
.
.
.

Bootfile: [alpha8400]as8000_v01.exe
[LFU boots]
UPD> update
confirm update on:
[list of devices]
[Y/(N)]n
P00>>> set simm_callout on      ⑦
P00>>> init
[self-test display appears]
P00>>> show simm
P00>>> set simm_callout off
P00>>> test                      ⑧
```

1. Replace the front door on the cabinet.
2. Attach the AlphaServer 8400 logo. Slide it into the panel on the front door of the cabinet.
3. Attach the product change label to the serial tag. Select the correct label from the sheet according to Table 4. Attach the label to the blank area on the right side of the serial tag.
4. Power up the system and check that all modules are listed in the self-test display. Also check that the LEDs on all modules light.
5. At the console prompt set the system model number, serial number, and environment variables (see ⑤ in Example 3). The variable <number> is the serial number from the DEC 7000/10000 or VAX 7000/10000 self-test display, which you noted in the procedure on page 5.
6. Boot LFU and update the firmware on all devices. See ⑥. You are asked for the name of the bootfile; enter [alpha8400]as8000_v01.exe.
7. Test memory for any failing SIMMs. See ⑦.
8. Run console diagnostics. See ⑧.
9. Boot the operating system and run one or two passes of VET.
10. Return the LSB hardware and modules to Digital.

Table 4 Cabinet Variants

Cabinet Part Number	Regulator
H9F00-FC	120/208 V, 60 Hz (U.S.)
H9F00-FD	220–240/380–415 V, 50 Hz (Europe)
H9F00-FE	202 V, 50–60 Hz (Japan)

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